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GREAT NORTHERN SPEEDS;

OR,

THE FASTEST TRAVELLING IN THE WORLD.

Being a "Study" of Great Northern (and M. S. & L.) quick-running Trains, according to the Time Tables, for the Summer, 1888 (with corrections added up to date, November 1st), with some Notes on the Fastest Trains of other English Lines.

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DEFINITION OF TERMS USED IN THE TABLES.

1. "JOURNEY SPEED" (or "Inclusive Speed").—The train's speed between any two given points, *including all stoppages*.

2. "RUNNING AVERAGE."—The train's speed with the time allowed at *each stopping station subtracted*.

In the case of a "platform to platform" run, (1) and (2) are, of course, the same.]

3. "FLYING AVERAGE."—The *average running* speed of the train *when clear of stopping stations*; a suitable allowance being made for the time lost in getting into speed at starting (5 minutes for 3 miles), and slackening before stopping (2 minutes for 1 mile).

Speeds are also given in some cases from one passing point to the other.

In every case the speeds are reckoned in miles per hour.

CONTENTS.

	PAGE
INTRODUCTORY	1
KING'S CROSS THE CRADLE OF FAST TRAINS	4
SPEED IS SAFETY	6
TRAIN LOADS, AND INDEX	8
MAIN LINE GRADIENTS (Table A)	9
TABLES.—I. FAST RUNS, PLATFORM TO PLATFORM	11
II. FAST BITS WITH AN INTERMEDIATE STOP...	13
III. FAST LONG JOURNEYS	14
IV. "LOG" OF THE BEST G. N. TRAINS	16
V. SOME HEAVILY-WEIGHTED TRAINS	17
VI. THE EDINBURGH RACER	18
VII. A FAST GOODS TRAIN	19
VIII. BEST SPEEDS ON G. N. AND "FOREIGN" LINES	21
IX. COMPETITIVE TIMES AND SPEEDS	22
X. FORMER FAST RUNS (1880)	23
APPENDIX—OUGHT THE RACE TO EDINBURGH TO BEGIN AGAIN NEXT SUMMER?	24

GREAT NORTHERN SPEEDS ;

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THE FASTEST TRAVELLING IN THE WORLD.

It has been said that the world knows nothing of its greatest men ; it might be said with more truth that the world knows little of its fastest trains. This lack of knowledge does not spring from want of interest ; one seldom goes a hundred miles by rail without hearing one or more animated discussions on train speeds.

When the public awoke to the fact that a "race on rails" was being run to Edinboro', articles, letters and paragraphs were to be seen daily in almost every newspaper, and were eagerly read. Travellers with a grievance seized the opportunity, and lifted up their voices in the *Times* to ask why there was no through direct service between, say, New Romney and Ramsbottom ; taking care to make it plain that *had* there been a through train they would have been quite unable to find it out in a time-table. Much nonsense, indeed, was written, but it was only a little handful by which one might "sample" the great bushel of blundering talk which anyone who knows something of railway working is doomed to hear. How many times has the writer, on opening his mouth, when seated in the best express on the South-Northern, to innocently remark, "This train is two minutes ahead of her time to-day," been met with the answer : "Ah ! but it does not go anything like the pace of the Great British trains !" (Now the G. B. have not a single train which makes a fifty-miles-an-hour run, while the S. N. train in question makes fifty-three easily.) "Indeed," we retort, "*which* of the G. B. trains is faster than this ?" "Oh ! several, which run from A to Z, a hundred miles, you know, in ten minutes under the two hours." "Pardon me, but Z is only ninety-seven miles, and the time taken—so I always thought—was only *two* minutes less than the two hours." "Oh ! well, perhaps you're right ; but it comes to nearly the same thing, doesn't it ?" One might almost say that it *does* in this imaginary case, compared with the remarks we have really heard in the last three months. Here are two specimens. "I see the Great Northern have taken off the train which ran down to Grantham in an hour and a-half." "In ninety minutes !" we gasped ; "do you know what the distance is from London to Grantham ?" "Oh ! yes," airily answers our friend, "just a *hundred and seventeen* miles." We assure the speaker that, like the man who had not left off beating his mother-in-law, the G. N. had not discontinued the train in question—for why ? they had never put it on ; no engine having as yet been built which could drag a train along at eighty miles an hour ! The following was said to us just as this little work was being got ready for the press : "I had to go down to Bedford the other day ; I left St. Pancras at 10, and was in Bedford by 10.40." Seeing a look of unbelief in our eyes, our friend added : "Yes, I assure you ; the train slips a carriage—fifty miles in forty minutes." We silently handed him an "A B C," which lay on the table, and opening it, he found the time of arrival (as therein given) to be 11.6 ; only *twenty-six*

minutes difference on a forty-nine mile run! . . . We were told the other day that for many a year the dwellers at Colwyn Bay have been wont to stand at their doors in open-eyed wonder to see the "Wild Irishman" hurtle by at sixty miles an hour. Now ten years ago, or less, the train in question was timed to make one of the *very slowest* long runs—Chester to Holyhead, eighty-six and three-quarter miles in 127 minutes—that any train called an express ever achieved, and it never did a bit of fast running on its whole journey. Having had two extra "stops" put in, and its time from Euston to Holyhead screwed up about half-an-hour, it is now a respectable, but by no means "flying" express. Yet, in spite of our witness on this head agreeing with Mr. Foxwell's, the British public will go on fondly believing that the Irish mail has always been a grand specimen of what English railways can do.

The other public favourites among fast trains are the "Flying Dutchman" (with her "Zulu" sister) and the east coast "Flying Scotman." The former deserves its reputation, for though its average speed is not quite what the splendid rush to Swindon would lead one to hope, it is heavily weighted, both in coaches and stops. The latter was always a good train if its long journey was looked at as a whole, but until its quickening last July it ranked among the *slower* rather than the faster of Great Northern expresses. What it does now can be seen on pages 11 and 14.

This lack of accurate knowledge as to train speeds is not altogether the world's fault. There is, indeed, one work on the subject, Mr. Foxwell's "Express Trains," which it would be impertinence to praise. But though almost perfect of its kind, it is now out of date,* and was never, we believe, issued at a popular price. It also happened to come out at a time when the tide of speed, most especially on the Great Northern, had ebbed from the high-water mark of 1880, and had not begun to rise again towards the "great flood's" level of August, 1888. It *may* rise higher yet next summer but as things now stand, this year marks the top point for train speed in England—England (or Britain rather, for Scotland is no whit behind) being well ahead of "all creation,"† and the G. N. R. unmistakably on any way of reckoning, ahead of the other railways of Great Britain, though two of its rivals are drawing up to it.

It is plain, then, that if we set forth correctly what the Great Northern is now doing in the way of fast running, we are recording the "fastest travelling in the world." When some other line cuts out the Great Northern, and takes first place—*when* it does—we shall be ready to chronicle its achievements.

One word it may be well to add, to ward off disappointment on the subject of "SIXTY MILES AN HOUR." A mile a minute is the ideal standard

* "Best Trains," mostly by Mr. Foxwell, only deals with the *improvements* made this summer, and does not pretend to speak of old established (unaltered) trains. Though most interesting, it is somewhat incomplete.

† The "England over-sea" of course ranks next to the mother country. Our information from the United States is not of the latest, but so far as we can find, there is only *one* Company, the Pennsylvania, and only some ninety miles of that, whose trains come up to the English "fast express" standard. There are several really fast trains on the very level run between Philadelphia and New York (Jersey City), but the best of these does not beat fifty an hour in any "platform to platform" run. Most of the *very long* American runs, *e.g.*, Fort Wayne to Chicago, are *wretchedly slow*, often at less than forty an hour.

of speed which the untaught railfarer sets up, and he will search in vain (except in Table VI. the "racing" train) for any such "record." *No train has ever yet been set to make a platform to platform run at that speed, though in actual running it was done more than once last August.* Nor is the reason of this far to seek. Every wheelman knows that though a speed of twelve miles an hour is easy work on a level road, if the surface be good, yet to cover *twelve miles in the hour* needs, in most cases, a rider who can cover a mile in about *four* (instead of five) minutes if need be, by reason of time lost up hill, round corners, &c. So with a train—almost every run at the rate of fifty an hour means at least a mile a minute for parts of the way, unless the line be extraordinarily level and clear of junctions, &c. Take for example, the Grantham to Peterboro' bit—twenty-nine miles in thirty-three minutes. Now, the "running average" in this case is nothing startling—only fifty-two and two-thirds. But the first five and a-quarter miles being all up-hill, mostly at $\frac{1}{15}$, a train "gets away very badly" from Grantham, and takes at least nine, or if heavy ten, minutes to cover that stretch. Then the finish, for nearly two miles, is through Peterboro' yard, so that three minutes may be safely allowed for the last one and three-quarter miles. This leaves only twenty-one minutes at best for the intermediate twenty-two miles (sometimes only twenty minutes). So that between "Stoke" and "New England" signal boxes, a speed of from *sixty-three to sixty-six miles* an hour is needed! Were it not for most of the twenty-miles being down-hill, even the moderate fifty-two and two-thirds average would be barely possible. [The last time we made this run, in a moderately heavy train, two miles about Corby were covered in 105 seconds, but we hardly made our right time into Peterboro'.] This last illustration brings us naturally to an important point in the tables belonging to this pamphlet, viz., the FLYING AVERAGE of each train or run made. What an enquirer most commonly means when he asks, "How fast does such a train go?" is this: "What pace does it make when it has got into full speed?" Now here is the one point on which Mr. Foxwell's pamphlet is found wanting. He gives, it is true, the "running average," but when a run is short or "stops" are many, the mere taking out the time allowed in actual standing at stations by no means shows us what the train's real running speed is. We reckon thus: the first *three* miles at starting will take at least *five* minutes, and the last one before stopping about *two* *; for each stop, therefore, we take away four miles and seven minutes, besides the time allowed at each station, from the distance and time respectively, to find the "flying average." Let us take two examples of the difference the two ways of reckoning make. Train A runs 107 miles in 135 minutes, with *one* stop of ten minutes; train B runs 105 miles in 130 minutes, with *three* stops, but the three take up only seven minutes between them. † This makes A's "running average" 107 miles in 125 minutes, against B's 105 in 123 minutes, so that A seems a shade the faster train. But any one can

* In these days of continuous brakes, the latter allowance may be rather too much, but so far as our experience goes, the former is too little, unless the train be very light. We have known a broad-gauge express take five minutes over the first *two* miles, or even less.

† A and B are the "Flying Dutchman," as between London and Bath, and the 10.40 a.m. up into King's Cross, respectively.

see that B is really much more delayed by its three short stops than A by its one long one, and so their *flying average* reckoning comes out thus: B covers eighty-nine miles of clear running in ninety-five minutes, while A takes 111 minutes to do ninety-nine clear miles; i.e., B's average is fifty-six and one-third to A's about fifty-three and a-half. Now take the case of a short run against a long one. A train goes from London to Peterboro', seventy-six and a-quarter miles, in eighty-seven minutes, other trains (more than a dozen of them in fact) cover the fifteen and a-half miles between Manchester and Warrington in eighteen minutes on the "Cheshire Lines." The "platform to platform" speed of the former train is nearly a mile an hour the better of the two—fifty-two and a-half against fifty-one and two-thirds. But while the "flying average" of the Peterboro' run is only fifty-four, the C. L. C. trains must cover the eleven and a-half clear miles in about *eleven* minutes to make their time into Warrington; at the least, they must average sixty an hour for eleven miles. Lastly, when we have reckoned as nearly as may be a train's full speed, there are still left the questions of level line and light load, or the contrary, to be asked or answered, if we are to rightly judge what is accomplished. By the great kindness of the officers at King's Cross we are able to give both an accurate table of main line gradients, and also the wonted (summer) loads of most of the trains. We hope that these may give a completeness to these statistics which may possibly make them of value in the eyes of Locomotive Superintendents, and other serious students of railway speeds. The *distances* have been reckoned as carefully as possible, often with the help of Mr. Airey's admirable maps, but when stations have platforms of 400 yards or more in length, it became difficult to settle the exact point to be measured to.

KING'S CROSS THE CRADLE OF FAST TRAINS.

In the far-off days of 1848-50 Mr. Brunel's broad-gauge engines first showed the world what locomotives could do, before the Great Northern Railway was "born or thought of." These wonderful speeds of fifty-eight miles an hour or so, platform to platform, were made with "feather-weight" trains, and were only kept up for two years or so, but the Great Western could nearly always boast one or more broad-gauge trains which, on a level road, could outstrip those of any other line for many years afterwards. Bit by bit, however, the narrow-gauge speeds rose from the "forty miles an hour" level to their present mark.* Almost from the opening of the line, the Great Northern led the way in the upward movement. Directly, or indirectly, it has been competition with King's Cross which has driven the powers at Euston, Liverpool Street, Derby, even those at Glasgow (Central) or St. Enoch (Glasgow) to quicken their pace. Wherever the stile of "fifty miles an hour" has been got over, if it were not a King's Cross stick which beat the dog, at least it was the Great Northern ox which began to drink the water—the butcher who began to kill the ox being the never-to-be-satisfied travelling public.

For example, Manchester is now within four and a-quarter hours of London by many trains. This is nothing very grand for 188 easy miles

* Shall we be believed when we say that the despised Eastern Counties then held the best place, with a train between London and Bishop's Stortford, at exactly 43 miles an hour! This was in 1845. It is said that it seldom did the journey at all, but usually ran off the rails half way.

(or 182 through the Potteries), yet, ten years ago, the Euston authorities thought four hours and forty-five minutes quite good enough—not till the Great Northern, in spite of their fifteen extra miles and the climb over the Pennine Range, cut the time down, first to four and a half hours, and then to its present time, did their rivals follow suit. The mention of Manchester reminds us that a friend, as well as foes, has learnt the lesson of fast running from King's Cross. The MANCHESTER, SHEFFIELD, AND LINCOLNSHIRE RAILWAY is bound up with the Great Northern in a closer alliance than exists between any two other independent companies*; and, when allowance is made for gradients, the provincial line is really nothing behind its London ally. It says much for Great Northern influence that a line under Sir E. Watkin's chairmanship should be such a contrast in this respect to the South Eastern. Not that in saying this we take away any of the credit due to the Manchester, Sheffield, and Lincolnshire for its running. On the contrary, we hold that for a small and far from wealthy line to bring itself fully up to the Great Northern standard is most praiseworthy; besides, in the case of the wonderful C. L. C. service between Manchester and Liverpool (worked by M. S. L. engines), the initiative came from London Road, not from King's Cross. It happens, too, that one of the fastest runs on the Great Northern (Grantham to Retford) is made with a "Sheffield" Co.'s engine on; in like manner, if any fast runs were done on the Lincoln branch of the Manchester, Sheffield, and Lincolnshire they would very likely be made by Great Northern engines. For these reasons, then, we have included some Manchester, Sheffield, and Lincolnshire running in our tables of fast trains—should this publication ever reach a second edition, we may add some further particulars under this head.

In its *average* running, even more than in its fastest trains, the Great Northern "holds up the torch of high speed." The "*slow fast*," which flourishes rankly on the Great Western, is not uncommon on the North Eastern, and is not unknown even on the Midland, finds no place in the Great Northern tables. Nine out of ten of the non-stopping trains in or out of King's Cross come up to Mr. Foxwell's "*express*" standard—that is, they make forty miles an hour including all stoppages. As may be seen in table I. not less than *twenty* trains make a run of over fifty miles an hour, station to station, at some part of their journey.

Nor is this done by a reckless cutting down of the load, in running wasteful additional mileage. Engines of to-day differ from those of twenty years ago mostly in their ability to pull a much heavier load. Some companies—notably the Great Western, whose narrow-gauge engines are wonderful at hauling a heavy load—have been content to use up all this new power in making their trains heavier; the Great Northern have transformed some of the added power into increased speed. Some of their express trains are light, no doubt, but there are none like the Edinburgh Special of the West Coast, where the North Western and

* The Great Western and the other Assoc. B.G. Cos. were even more closely linked, but these latter, though *separate* companies, were never independent.

† The "Afghan" (4.45 p.m. from Paddington) makes a wonderful run to Oxford at forty-nine miles an hour, with a load sometimes equal to 16 (6-wheel) coaches. This is very fine, but the much lighter 9.55 a.m. runs no faster, nor does any other narrow gauge train on the Great Western achieve more than fifty miles an hour, platform to platform, whatever its load.

Caledonian between them run 380 train miles a-day (Preston to Edinburgh and back) for the sake of saving thirty minutes for some twenty Edinburgh passengers each way. The Great Eastern Company's excellent passenger service is far more lavish of mileage than the Great Northern's, and some of the latter's expresses are enormously heavy for the hills they have to get over. What is done is wisely accomplished by having a perfect road, the best engines, with the best drivers on them, no unwise stinting of coal, and a well-paid staff which knows that King's Cross "expects every man to do his duty."

SPEED IS SAFETY.

This heading looks like a paradox, but it is really more like a truism. To begin with, a good road, good engines, and a carefully trained and disciplined staff are needful (as we have just said) for high speeds to be attained—now all these clearly make for safety. Next, well built and well kept rolling-stock is needed, that it may not soon be worn out by the shaking it gets; now a heavy coach will keep the rails, and a solid one will not "telescope," in cases where lighter stock, good enough for slow trains, will be made matchwood of.

Then, too, on a fast express everything is sure to be carefully overhauled at every point; the risk of crank axles, carriage wheels, or couplings breaking is brought to its lowest point. Further, think how the knowledge that almost at any hour a "flyer" may be looked for to dash by at sixty an hour—as is the case all along the Great Northern line—keeps signalmen, switchmen, and station-masters on the look-out.

Next to mechanical defects, the commonest cause of accidents is *unpunctuality*. Now, with a few exceptions, in the stress of summer traffic, the *fastest* trains everywhere are notably the *most punctual*. The whole staff is proud of these trains, their guards are the smartest; every nerve is strained to keep them up to time—and keep time they do. "Run to time first of all, and *then* begin to think about your coal-sheet;" where this is in effect a driver's instructions, there is none of the crawling up hill and running dangerously fast *down* a bank, which we find on lines where the "premium on coal saved" system is followed. Here it is time to say that the very highest speed is not in the least unsafe except round sharp curves and down steep banks, if only the road, rolling-stock, and brakes be good. But high speeds bring about caution at all points where caution is needed; compare the way Brighton trains bang and bump through Red Hill or Three Bridges at forty-five an hour, with a Great Northern "racer's" irritating crawl of fifteen miles an hour through Peterboro' station, or its snail-like creep round the Retford curve at about *five*! Lastly—look at Dijon the other day; look at Downton a few years back: in each case what do we see? No fast trains, road allowed to get in a bad state, unpunctual running; a driver who is late hurries up a bit more than usual—smash. No good English line *dare* have let its permanent way remain for a day in the state the line had been in for weeks at the foot of that Dijon bank—but then France knows not the "Racing Express."

SOME "SAMPLE" RUNS.

The late "Edinburgh Race" runs have so hopelessly thrown all others into the shade that the notes we had got ready under this head would seem tame by comparison, nor could we hope to tell the tale of that race in the way Mr. Acworth and Mr. Foxwell have already told it. But there are two performances which linger in our memory, and which we cannot leave altogether "unsung." One was a trip by the 2.0 p.m. Up from Manchester; at Sheffield we were nearly three minutes early, and of course waited for time. The same engine brought us along at a great pace up the twenty miles of rise from Carlton, and landed us at Grantham a full two minutes too soon. We started thence punctually, and had gained a little on our time to Peterboro,' when the brakes went down, and we pulled up "dead" at the level-crossing just south of Peterboro' station—tail lamp out—(it was in the darkest part of the year). We only stood for about a minute, but the "stop" meant at least four minutes against us. Now was the time for our "eight-foot" engine to show what it could do. Abbot's Ripton once passed we began to catch time up again, and in the end we ran under the roof at King's Cross at exactly 6.15. This was with a light train, it is true, and a long run. Here is a case of hard running with a by no means light train, and little room left for getting up high speed. Some two years ago, when the 5.30 p.m. Down had an extra stop at Newark on Wednesdays (with no extra time allowed for it), we took that train from Grantham, being keen to see if it could possibly keep time into Retford. On ordinary days it seemed to have not much to spare, its "flying average" for the run being about fifty-five an hour.* As usual the train was made up of a dining-hall on wheels (weighing some thirty tons), and six other vehicles, one of which happened to be a heavy bogie—in all, a load equal to nine ordinary coaches. Our engine was a "Sheffield" Co.'s, but with sundry Great Northern "points," such as outside cylinders, big single driving-wheel with heavy weight on it, &c.; the "number of the beast" was 506. The rails were covered with snow, but there was no wind to check us. We were off to time, of course, and the run to Newark being all down hill, it was not very hard to cover the fourteen and three-quarter miles in seventeen minutes. After barely a minute's stop we were off again; a good twenty-one minutes left for our next eighteen and three-quarter miles, but with 100 feet to climb in five miles on the way. After Carlton our gallant engine snorted and panted (and slipped) not a little, but from Tuxford the slope was in our favour, and we ran into Retford only some thirty seconds late. At 8.20 to the moment were off again, and well "on time" into Sheffield. Our "flying average," when in speed, had been over sixty-two an hour between Grantham and Retford; it had been fully sixty on the last half, with the bank at $\frac{1}{16}$ "thrown in." We told this to a very able time-bill clerk at head-quarters of another great company. "Our guards would have claimed *ten minutes* for such an extra stop" was his comment on it.

* Thirty-three and a-half miles (barely) in thirty-nine minutes, or speed platform to platform fifty-one and a-half.

TRAIN INDEX AND TRAIN LOADS.

The load of each train is given in 6-wheeled coaches; a Dining or Pullman Car is reckoned as two, and a "bogie" (8-wheeled) as one-and-a-half ordinary coaches. An ordinary Great Northern (or an "East Coast Joint") coach weighs *thirteen* tons; it is probably the heaviest 6-wheeled vehicle run, being both unusually long and very solidly built. So that a Great Northern train of ten coaches is at least as heavy as any southern company's of twelve, or, perhaps, thirteen.

Train from or into King's Cross.	No. of Coaches (from or into King's Cross, unless otherwise stated) †	Mentioned in Table.	Notes.
PAGE			
Down			
5 15 a.m.	11	I. (Note †) ...	11
7 40 "	6	I. & II. ...	11 & 13
8 50 "	10½ and extras ...	I. & II. ...	11 & 13
9 45 "	10	I. & III. ...	11 & 14
10 0 "	10 to 13	III. ...	... 14
10 0 " (Special)	9, 8 or 7	VI. ...	18 & 19
Edinboro Expss.)			
10 25 a.m.	13 to 15	V. ...	17
1 30 p.m.	11½	I., II., III. & IV. }	11
2 0 "	{ 8 to 10 (beyond Peter- borough 6 to 7) }	I., II., III. & IV. }	etc.
3 0 "	14 (beyond Hitchin 11)	I. ...	11
3 20 " Goods	23 waggons ...	VII. ...	19
5 30 "	12½ (8½ beyond Newark)	V. ...	17
5 45 "	14	I. ...	11
Up.			
10 40 a.m. (Mon- days only.)	7	I., II. & IV. ...	11, 13 etc.
1 0 p.m.	9½	I. & II. ...	11 & 13
1 55 p.m.	10½	I. & III. ...	11 & 14
2 5 "	8 or more	I. ...	11
3 35 "	[Short]	I. ...	11
5 45 "	9½	I. ...	11
6 15 "	6	I., II., III. & IV	11 etc.
6 30 "	9 to 15	III. ...	14
6 50 "	6½	I. ...	11
7 55 "	7	I. (Note †) ...	11
9 30 "	7	I. & II. ...	11 & 13
9 45 "	7	I. ...	11
10 50 "	10 or more and extras	V. ...	17

† The ordinary *Summer* make-up is given, as the trains are timed the same Summer or Winter, and as a rule keep good time even in August.

GREAT NORTHERN MAIN LINE GRADIENTS.

The speed of a train is so much affected by the *gradient*, that it is needful to look carefully at the rise and fall of the line over which any given run is made before we can rightly reckon whether the time made is really good or not. Every "wheelman" knows how soon a rider feels a slight rise in the road, which when walking he would never have heeded, and the heavier his cycle, and the larger (or "higher-gearred") his wheel, the more he feels it.* So it is with a locomotive, "only more so." Roughly speaking a climb of one in one hundred is as bad to an engine as a hill at one in twenty or so is to a cyclist. We should say that a rise of one in five hundred even will perceptibly affect an average train's speed, while anything under one in three hundred affects it seriously. From one in two hundred it may be called a case of "hill-climbing," after one in one hundred a "bank" is really steep, while an up-grade of one in seventy is about the utmost a self-respecting express engine can be asked to look at.

* Cyclists find practically that a "high-gearred" small wheel climbs better than a big one ungeared—of course engine wheels cannot be "geared" up or down.

Of steep hills (at 1 in 100 or less) the Great Northern Main Line is happily free, though there are plenty of them in the West Riding, especially towards Bradford. Between Retford and Manchester the M. S. & L. Co. have hardly a level mile, while west of Sheffield there is a fearsome climb on the journey over the Pennine Range for some eighteen miles on either side, at an average of about 1 in 125 down, and rather less coming back. But though the Main Line has no steep hills, yet an abundance of long slopes, mostly at $\frac{1}{200}$, make up for the lack of steep bits: indeed 1 in 200 may be called the Great Northern "ruling gradient." The worst climb is, of course, that to the "summit level" at Stoke Box, a rise of over three hundred and thirty feet in the thirty miles from the lowest point at Holme. Twenty miles of these are at a perceptible slope, and the last three are at $\frac{1}{175}$. The first thirteen miles out of London are bad enough, with a start at 1 in 105, but they are broken by some two and a-half miles nearly level, from Finsbury Park northwards.

For more ease in reckoning, and also to avoid possible difference of opinion as to what is meant by "sea-level," heights in the following table are reckoned from *King's Cross* as a zero. Its true height on the "Great Northern Datum," ninety-one and a-half feet below Trinity high-water mark, is fifty-two feet; but in the wonted (Ordnance) datum* it is said to be about 130 above "sea-level."

TABLE A.—GRADIENTS (Main Line).

Heights above K. C. are marked \times , depths below K. C. are marked \S , and in *italics*.

MILES FROM K CROSS	Heights in Feet above (or below) King's Cross.	Approximate Gradient between the Places.	Notes on Gradient for Up Trains from York
12 $\frac{3}{4}$	Potter's Bar, $\times 274$	$\left\{ \begin{array}{l} \text{up-hill, range from } \frac{1}{105} \\ \text{(to Holloway) to } \frac{1}{200}, \\ \text{about Barnet } \frac{1}{200} \end{array} \right.$	28 miles to Shaftholme almost level
17 $\frac{3}{4}$	Hatfield ... $\times 203$	$\left\{ \begin{array}{l} \text{down-hill } \frac{1}{200} \text{ to } \frac{1}{125} \\ \text{up-hill } \frac{1}{200} \text{ to } \frac{1}{200} \end{array} \right.$	11 miles up-hill, slight, except last 2, steep ($\frac{1}{125}$)
25	Mile Post ... $\times 283$		4 $\frac{1}{2}$ miles to Scrooby down-hill, steep at first, the last 3 slight
[32]	Hitchin]	$\left\{ \begin{array}{l} \text{down-hill } \frac{1}{200} \text{ to } \frac{1}{125} \\ \text{slight down-hill or level} \end{array} \right.$	About 14 miles to Tuxford up-hill, mostly slight, but part at $\frac{1}{200}$
35	Three Counties $\times 98$		5 miles down-hill, about $\frac{1}{200}$
47 $\frac{3}{4}$	Tempsford ... $\times 15$	slight down-hill or level	Carlton to Stoke Box 26 miles up-hill, at $\frac{1}{200}$ to $\frac{1}{200}$
51 $\frac{1}{2}$	St. Neots ... $\times 47$	slight up-hill	Over 20 miles down-hill, first 13 at $\frac{1}{175}$ to $\frac{1}{200}$
56	Offord ... $\S 10$	down-hill $\frac{1}{200}$ to $\frac{1}{200}$	Near Peterborough about 6 miles nearly level (a little up)
[58 $\frac{1}{2}$]	Huntingdon ...	$\left\{ \begin{array}{l} \text{up-hill slight to Hunt-} \\ \text{ingdon, then } \frac{1}{200} \end{array} \right.$	Several miles about level (a little down)
63 $\frac{1}{4}$	Abbots' Ripton $\times 84$		About 5 miles (to Abbot's Ripton) up-hill $\frac{1}{200}$
69 $\frac{1}{2}$	Holme ... $\S 39$ (Lowest Dip.)	down-hill $\frac{1}{200}$, then level	7 miles down-hill, $\frac{1}{200}$
72 $\frac{1}{2}$	Yaxley ... $\S 18$	level, then slightly up-hill	5 miles much up-hill, then 4 slight down-hill (to Retford)
76 $\frac{1}{4}$	Peterborough ... \S	nearly level	Over 22 miles nearly all up-hill $\frac{1}{200}$ to almost level (to 25 mile post)
83 $\frac{1}{4}$	Tallington ... $\S 3$	very slight up-hill	All down-hill to London, except 5 miles up (Hatfield to Potter's Bar)
96 $\frac{3}{4}$	Corby ... $\times 205$	up-hill, last 10 at $\frac{1}{200}$	
100	Stoke Box $\times 295$ (Summit Lev.)	steep up-hill, mostly $\frac{1}{175}$	
105 $\frac{1}{4}$	Grantham $\times 158$	down-hill, mostly $\frac{1}{200}$	
126	Carlton ... $\S 15$	still down-hill, av. $\frac{1}{200}$ (abt)	
131 $\frac{3}{4}$	Tuxford ... $\times 86$	up-hill, mostly $\frac{1}{200}$	
[138 $\frac{1}{2}$]	Retford]	$\left\{ \begin{array}{l} \text{down-hill, from } \frac{1}{200} \text{ to} \\ \text{very slight} \end{array} \right.$	
145 $\frac{1}{2}$	Scrooby ... $\S 28$		
147 $\frac{1}{2}$	Bawtry ... $\S 9$	up-hill, slight slope	
149	Mile Post ... $\times 35$	sharp up-hill, about $\frac{1}{125}$	
151	Rossington ... $\S 9$	sharp down-hill, about $\frac{1}{200}$	
[156]	Doncaster ...]		
160	Shaftholme Jnc. $\S 27$	slight down-hill	
188 $\frac{1}{4}$	York	almost level throughout	

* The "mean" water level at Liverpool.

Altogether a down train has fully fifty-six miles "against collar" up to Doncaster, after which the remaining thirty miles to York are beautifully level. An up train, though it has few steep climbs, yet has the hill against it almost the whole way from Shaftholme to Stoke—sixty miles. Altogether it has a total of nearly ninety miles at a rising gradient.

FAST RUNS (over 50 miles an hour) "PLATFORM TO PLATFORM."

To begin with, here are some twenty instances of "platform to platform" runs, each at a speed of over fifty miles an hour. Some of them belong to the same train at different stages of its journey, but well nigh *thirty* different trains are included in the list, No. 18 for example applying to five up trains. To take in what this means, we must look at other lines for a comparison.

Outside England, not one train in Europe, and hardly any in America (with all its enormous mileage) rises to this level. South of the Thames there is now *one* South Western train—a light one—which nearly touches but still falls short of it; on the other southern lines, not one. The Great Eastern, a model passenger line in everything except high speed, still fails to bring any of its many expresses up to this standard.

Even the Great Western can shew only four trains, all of them broad gauge and not third class, which would come into this table. The North Eastern, with gradients like unto those of the Great Western, could take a good place, with one train and a heavy one at that, but it is with one *only*, and on a run all either dead level or down hill (Darlington to York). In fact, the Great Northern could pretty well "set out" the whole of the rest of the civilised world with fifty-mile-an-hour runs.

In one way, too, these remarks and the heading of table No. I. fall below the truth, for when worked out, nearly all these runs proved to be at a speed of *fifty-one* miles an hour or upwards. This, bear in mind, with trains of all weights (up to twelve or so 6-wheel coaches), and on gradients sometimes favourable, but hardly ever without some decided uphill in part of the run. We are by no means sure that the list given is an exhaustive one, for so many of the Great Northern trains make unlooked-for bursts of speed at some point that it is hard to track them out. For example, the 3.0 p.m. down starts off at a sober enough pace, with "fourteen on" (not reckoning stray horse-boxes), but, having lightened its load by three coaches at Hitchin, it spins thence to Peterborough at fifty-three miles an hour. More startling still is the up Leeds train due in London at 5.45 p.m., which, after ambling along quite gently for its first 130 miles, then dashes over the $56\frac{1}{4}$ miles between Huntingdon and Finsbury Park at better than the "Flying Dutchman's" best speed, indeed; it does the first twenty-seven miles of this "burst" in about twenty-nine minutes, including the start from Huntingdon—say fifty-five and a-half miles an hour. It is fair to say that two of the runs given are not strictly platform to platform, since the arrival times are for a slip, and not a stop (Nos. 7 and 16, table I.). But in each case the train slows down to run cautiously through the station; in the case of Retford, it may be called a stop—all but the actual standing still; while at Peterborough the 2.0 p.m. down is so often *ahead* of time that the slip-coach

TABLE I.—FAST RUNS WITHOUT A STOP.

Train.	RUN		Dist. M.	Time H. M.	SPEED.		Notes.	Ref. No.
	From	To			Run- ning Av.	Flying Av.		
p.m. 6.15 up	Grantham	King's Cr.	105 $\frac{1}{4}$	1 57	54	55 $\frac{1}{2}$	The up train has the better gradient; the dn. is heavier for 76 m. and is usually 1 min. early at Grantham.	1
p.m. 2.0 dn.	King's Cr.	Grantham	105 $\frac{1}{4}$	1 59	53	54 $\frac{1}{2}$		2
a.m. 10.0 dn.	Grantham	York	83	1 36	51 $\frac{7}{8}$	53 $\frac{1}{4}$	The 10.0 dn. and 6.30 up are often very heavy: in Aug. the up is 12 to 15 coaches.	3
p.m. 6.30 (& 70up**)	} York	Grantham	83	1 37	51 $\frac{1}{4}$	52 $\frac{3}{8}$		4
p.m. 1.30 dn.		Doncaster	80 $\frac{1}{2}$	1 32	52 $\frac{1}{2}$	53 $\frac{3}{8}$		5
p.m. 1.30 dn.	King's Cr. †	Peterboro'	76 $\frac{1}{4}$	1 27	52 $\frac{1}{2}$	54	[NOTE ||.—In these two cases the "flying av." is reckoned with allowance for time lost in starting only.]	6
p.m. 2.0 dn.	Do.	Do. arr. by slip coach	76 $\frac{1}{4}$	1 25	53 $\frac{3}{4}$	55||		7
several up trains a.m.	} Peterboro'	King's Cr.	76 $\frac{1}{4}$	1 30	51	52 $\frac{1}{4}$	On Monds. one train runs up in 1h. 28m., with a stop at Finsbury Park.	8
10.40 up		Finsb. Pk.	73 $\frac{3}{4}$	1 20	55 $\frac{1}{3}$	57 $\frac{1}{3}$		9
p.m.* 1.55 up	Wakefield	Grantham	71	1 22	52	53 $\frac{1}{2}$	Fastest run, "platform to platform" in Europe: over 25m. of the run are up-hill, about $\frac{1}{200}$ to $\frac{1}{140}$.	10
p.m. 2.0 dn.	Grantham	Sheffield	56 $\frac{3}{4}$	1 8	50 $\frac{1}{10}$	52||		11
p.m. 5.45 up	Huntingd.	Finsb. Pk.	56 $\frac{1}{4}$	1 3	53 $\frac{1}{2}$	56	M.S.L. engine. Steep grades beyond Retford: is usually 1 to 3 min. early at Sheffld.	12
a.m. 9.45 dn.	Grantham	Doncaster	50 $\frac{3}{4}$	0 56	54 $\frac{1}{3}$	57 $\frac{1}{4}$		13
Many dn. & up	} Doncastr (or vice- versa)	Grantham	50 $\frac{3}{4}$	1 0	50 $\frac{3}{4}$	53	One train does this journey in the same time with a "stop" at Retford. See Table II.	
p.m. 3.0dn. †		Hitchin	44 $\frac{1}{4}$	0 50	53 $\frac{1}{10}$	56 $\frac{1}{2}$		14
a.m. 7.40 dn.	Grantham	Retford	33 $\frac{1}{2}$	0 38	52 $\frac{1}{2}$	57	(11 coaches, and sometimes "extras.")	15
p.m. 2.0 dn.	Do.	Do.	33 $\frac{1}{2}$	0 36	55	59||	Mostly down hill.	16
p.m. 1.0up&c.	Retford	Grantham	33 $\frac{1}{2}$	0 39	51 $\frac{1}{2}$	55 $\frac{1}{4}$	M.S.L. engine.	17
Many up trains a.m.	} Grantham	Peterboro'	29	0 33	52 $\frac{3}{8}$	57 $\frac{3}{8}$		18
a.m. 8.50 dn.	Hitchin	Huntingd.	26 $\frac{3}{4}$	0 30	53 $\frac{1}{2}$	59 $\frac{1}{3}$	Over 20m. continuous up-hill, about $\frac{1}{200}$.	19
p.m. 3.35 up	Hatfield	Finsb. Pk.	15 $\frac{1}{4}$	0 18	50 $\frac{5}{6}$	60		
p.m. 1.0 & 9.30 up	} Doncaster	Retford	17 $\frac{1}{2}$	0 20	52 $\frac{1}{2}$	60		20
						over 60	[N.B.—Distances marked with a §, thus 17 $\frac{1}{2}$ §, are a few chains short of the mileage stated.]	21

* Mondays only.

† The 7.55 p.m. up does the same run (the opposite way) in 51 min., with the gradient against it (up-hill bits of 5, 4, and 15 miles respectively: much of it at $\frac{1}{200}$).

‡ There are several other trains, King's Cross to Peterborough, in 1h. 28m. to 1h. 30m.: the 5.15 dn. runs in 1h. 30m. with a stop at Finsbury Park.

¶ No allowance is made for the slackening through Retford in reckoning the "flying average."

** Ran during September only.

must often put out its passengers on Peterborough platform within the allotted eighty-five minutes from London.

Some of the best runs given below are considered more fully in the remarks (page 14) for table IV. Those between London and Grantham (down or up) in two hours and three minutes (or at a speed of fifty-one and one-third miles an hour) are not given here, though two of them are made by heavy trains—that by the 5.30 p.m. down with a load equal to twelve ordinary coaches for more than half the way, is really one of the best performances we know of.

FAST BITS WITH AN INTERMEDIATE STOP.

If an average speed of fifty miles an hour in a through train be a standard of speed which only the best English lines reach to, and that in the case of only a few trains, what shall we say of the same speed with an intermediate stop “thrown in?” Still more noteworthy is it when, as in most of the instances given below, the run is a short one (forty to fifty miles) so that the intermediate stop cuts it into “snippets” of twenty miles or so over which fast running seems almost impossible. The quickened Scotch express of the London and North Western Co. (10 up from Edinboro’) just makes fifty miles an hour as between Crewe and Willesden, but this is with long runs of seventy-eight and seventy-six or so miles each, and with a favourable gradient most of the distance. The Midland comes near to the standard by many trains (with longish runs in each case), but it achieves it splendidly in one, the 2 p.m. from St. Pancras, as between London and Nottingham.* This train does the 124 miles in two hours and twenty-five minutes, with a stop at Kettering, an inclusive speed of fifty-one and one-third miles an hour; the train is rather light, but the gradients are severe.

The Great Western never rises to this height by any train, broad or narrow gauge, though the down “Zulu” comes near it between Bristol and Exeter.† Of other railways it is needless to speak. It is somewhat odd that for some years no less than three trains should have run between Grantham and Doncaster in from sixty to sixty-two minutes with a stop at Retford, while no train made the direct run in less than the hour until this month (November). In two out of the three instances (Nos. 6 and 8, Table II.) coaches have to be dropped or taken on at Retford, so that the time allowed there (one and three minutes respectively) is certainly less than the actual time usually taken up by the work to be done. In the case of the up trains, there is an adverse gradient, fairly steep in parts, to be faced for most of the way.

* This splendid train which runs to Manchester via Nottingham, Codnor Park and Ambergate, is so hampered by curves, junctions and gradients, that its average to Manchester is not very remarkable. But to Nottingham its running average is over fifty-two; and its flying average all but fifty-four. When allowance is made for curves and “banks,” it deserves to rank only just behind the best G. N. trains.

† Even if the G. W. trains were not bound to wait ten minutes at Swindon, their very poor speed (considering that the gradient is nearly all level or downhill) between Swindon and Bath (barely thirty miles in thirty-eight minutes, or only forty-seven and one-third an hour), would bring the “Dutchman” or “Zulu” into Bath too late to make an inclusive fifty an hour from Paddington.

It will be seen that in one case 102 miles are covered at a speed of just over fifty an hour, with *two* intermediate stops (this "record" is accomplished by that wonderful "Mondays only" fast, due in King's Cross at 10.40), and also that the 9.45 a.m. and 1.30 down make *just* fifty an hour, London to Wakefield, also with *two* intermediate stops.

TABLE II.—FAST RUNS (50 miles or more an hour) INCLUDING AN INTERMED. STOP.

Train.	From	To	Dist.	Time	No. of mins stop.	Journey Speed.	Running av.	Flying av.	Notes.
p.m. 1.30 dn.	London	Doncaster	156	3 3	4	51 $\frac{1}{2}$	52 $\frac{1}{4}$	53 $\frac{9}{11}$	
p.m. 2.0 dn.	London (Down and up.)	Sheffield	162	3 12	5	50 $\frac{3}{4}$	52	53 $\frac{1}{2}$	M.S.L. eng. betwn Grnthm & Sheffield
6.15 up Monds. only		Grantham	102 $\frac{3}{4}$	2 2	5	50 $\frac{1}{2}$	52 $\frac{3}{4}$	56 $\frac{3}{4}$	<i>Two</i> intermd. stops (Essendine and Peterboro').
a.m. 10.40 up	Essendine	Finsb. Pk.	86	1 41	3	over 51	52 $\frac{3}{4}$	55 $\frac{1}{2}$	
a.m. 9.45	Grantham	Wakefield	70 $\frac{1}{2}$	1 22	3	51 $\frac{3}{4}$	53 $\frac{1}{2}$	57 $\frac{3}{4}$	
7.40 dn.	Do.	Doncaster	50 $\frac{3}{4}$	1 0	1†	50 $\frac{3}{4}$	51 $\frac{1}{4}$	56	(† nominal; needs at least 2.)
p.m. 9.30 up	Doncaster	Grantham	50 $\frac{3}{4}$	1 1	2	50 $\frac{1}{4}$	51 $\frac{1}{4}$	57 $\frac{1}{2}$	} Mostly up hill.
1.0 up	Do.	Do.	50 $\frac{3}{4}$	1 2	3	49 $\frac{1}{2}$	51 $\frac{1}{4}$	57 $\frac{1}{2}$	
5.45 up	Peterboro'	Finsb. Pk.	73 $\frac{1}{2}$	1 27	1	50 $\frac{3}{4}$	51 $\frac{1}{4}$	54 $\frac{1}{4}$	[See Note §, p. 11, Table I.]
8.50 dn. a.m.	Hitchin	Peterboro'	44 $\frac{1}{4}$	0 53	1	over 50	over 51	57 $\frac{1}{4}$	

Runs between London and Peterboro' with a Finsbury Park stop, at over 50 m. an hour, are not given here, as the nearness of Finsbury Park to King's Cross makes the delay less than is caused by an ordinary intermediate stop.

FAST LONG JOURNEYS—TERMINUS TO TERMINUS, OR "FRONTIER STATION."

Taking forty-seven miles an hour "journey speed" as our minimum standard—a high enough one to shut out all competitors, except the Caledonian,* Midland, and London and North Western, from the contest, we find that in September, 1888, there were six down and five up Great Northern trains that reached to or rose above this level; eight at least of which ran throughout the year. Of the whole eleven, seven are York trains; only the three quickest of these are given in the table below, though two of them (the 10.25 a.m. and 1.30 p.m.) really achieve wonders, the former having an enormous load of thirteen to fourteen coaches, and the latter stopping *four* times (including York ticket station), with a fairly heavy load throughout—eight minutes allowed at Doncaster. But none of the York (or through Scotch) trains are at quite the best Great Northern pace; the Leeds ones are much "let" by stops and junctions north of Doncaster, while the splendid Manchester express does wonders to Sheffield, but has its "average" spoilt by the gradients beyond. So that, on the whole, the Great Northern is not so much ahead of the rest of the world in through "journey speeds," as it is in other ways—though here its *average* is much the best. The recent

* The Caledonian gets into the list rather by good luck; it has one train each way between its "frontier station" (Carlisle) and a terminus (Edinboro'), which come well inside the limit of forty-seven an hour; but each of these make the journey *without a stop*; the whole run being only 101 miles. The down train does it in one hour and fifty-eight minutes, *i.e.*, at fifty-one and a-quarter miles an hour.

quickening of the best Midland Scotch train, up and down, gives it a "journey speed" between London and Normanton (185 miles in three hours and forty-three or three hours and forty-two minutes) only just behind that of the "Flying Scotchman" to York, and this on worse gradients, though with a lighter train.

TABLE III.—FAST LONG JOURNEYS : 47 m. an hour, or more, for the whole run.

Train.	From or to London		Dist.	Stops.		Journey Speed.	Running av.	Flying av.	Notes.
	And	In		No. of	Mins				
"Flying Scotchman" (10.0 dn. 6.30 up) } a.m. } 9.45 dn. }	York ...	H.M. 3 45	188 $\frac{1}{4}$	1	5	50 $\frac{1}{5}$	51 $\frac{1}{3}$	52 $\frac{1}{3}$	
	Leeds { Holbeck	3 46	185 $\frac{1}{2}$	3	9	49 $\frac{1}{4}$	51 $\frac{2}{3}$	barely 53 $\frac{2}{3}$	
	(Central)	3 50	186	4	11	48 $\frac{1}{2}$	51		
1.55 up	Leeds (up)	... 3 55	186	4	13	47 $\frac{1}{2}$	50 $\frac{1}{8}$	barely 53	
2.0 dn. }	Manchester	... 4 15	203 $\frac{1}{4}$	2	9	47 $\frac{3}{8}$	49 $\frac{5}{8}$	{ over 51 $\frac{1}{2}$	{ Very heavy grad'nts west of Retford.
6.15 up }	Bradford	... 4 3	192	4 (or 5)	13	47 $\frac{3}{8}$	over 50	53	

† Bradford is on a *branch* line, with very steep grades and difficult junctions north of Wakefield, yet the "journey speed" is over the standard of 47.

THE BEST GREAT NORTHERN TRAINS.

The first place among *daily* trains of course belongs to the Manchester "Special Express," down and up. The down (2.0 p.m.) can no longer be called *light*, as with the Cromer through coaches added, it never starts with less than eight "on," which in summer often grows to *ten*; from Peterborough to Retford it does not exceed seven, and beyond Sheffield it is a really short train of five coaches. Its speed between Hitchin and Peterborough averages fifty-seven and three-quarter miles, in spite of the sharp rise north of Huntingdon; this, remember, with its full load on. Though it climbs over 300 feet from Peterborough to Stoke Box, it averages over fifty miles an hour for that twenty-three and three-quarter miles, and down the hill from Grantham it runs between Barkstone and Newark—ten and a-half miles—at well over "a mile a minute." Beyond Retford it is timed very easily, being *two minutes slower* thence to Sheffield than the much heavier 5.30 p.m. This enables it to run in *ahead* of time, which it does so often that it seems a pity not to "book" it to arrive at Sheffield at 5.10. ["If they did, I believe she would get in at 5.8," said the Inspector, at Victoria, Sheffield, in answer to this suggestion.] It also has some minutes in hand, in spite of the stiff climb thence to Manchester, as its "flying speed" is no greater than that of two heavier trains, so that unless checked outside London Road Station it is often early, and hardly ever a minute late at Manchester.

The up train has certainly a light load throughout, it having ordinarily only "six on" from Sheffield to London. From Retford to Grantham it is allowed thirty-eight minutes (or two more than the down train); this is very fine running, for it means a speed of all but fifty-three an hour on an up-hill grade, sometimes of $\frac{5}{25}$ for five-sixths of the distance. But the Manchester, Sheffield and Lincolnshire engines

are used to up-hill work, and the train is often two minutes early into Grantham. Onwards to Peterborough it does no more than other (and heavier) up trains; thence to London it takes the same time as the down train, at a lower speed to Hitchin, but with a good run in from Hatfield at a speed from thence to Holloway of about fifty-four miles an hour, allowing for the great reduction of speed which is always made from Copenhagen Tunnel into the terminus. On the whole, the 6.15 up, though it makes the fastest daily long run, platform to platform, in the world (Grantham to London at fifty-four miles an hour) does not achieve so much, all things considered, as the down train. But we have known it stopped dead for a minute or so between Peterborough Station and Fletton—"tail lamp out," and yet run under King's Cross roof at 6.15!

Perhaps from its being a "Mondays only" train, the wonderful 10.40 a.m. up has somehow escaped public notice. But when looked into its running quite cuts out all others, even the foregoing Manchester trains; moreover it is not racing against any other Company, being altogether a train from non-competitive places, so that it makes its wonderful speeds in sheer "lightness of heart." The "special" run is from Peterborough only (continuation of the ordinary 6.50 from Doncaster), but if reckoned from Grantham its times are striking. Leaving out the impossible sixteen and three-quarter miles in nineteen minutes,* which is its timing Grantham to Essendine, we find that it runs from Grantham to King's Cross with *three stops* in two hours and ten minutes, or only a minute more than the "Flying Scotelman" used to take for the direct run before it was quickened this July, two minutes more than some of the best up trains take with *one stop* only at Peterborough. But from Peterborough to Finsbury Park, let us suppose it to leave the former place as the Manchester "flyer" glides through; at Huntingdon it is still one minute behind; at Hitchin it has drawn level, then spinning at an amazing pace up the bank for seven miles, and rushing down the other side to Hatfield, it leads by nearly a mile. It deserves to, having covered the last fourteen and a-quarter miles, half of them up hill, in fifteen minutes; the remaining next fourteen and a-half miles to Haringay are again reeled off in about fifteen minutes—this time on an easier gradient, and it can there shut off steam and draw up at Finsbury Park some seconds before the other train (which we suppose to be rushing at sixty miles an hour over the last mile while the 10.40 is pulling up) reaches that station.

The train's ordinary load is seven coaches, so that, though not heavy, it is no "feather weight," being at least fifteen tons heavier than the "Flying Nor'-Western"† of August last. It certainly holds what cyclists call a "World's Record" for its run of seventy-three and three quarter miles, Peterborough to Finsbury Park in eighty minutes—a speed of over fifty-five miles an hour, on a run with quite thirty miles of up-hill in it.

After this, the 1.30 p.m. down will seem a sober, steady-going train

* The ordinary 11.10 a.m. into King's Cross is timed to do this daily, on Wednesdays and Saturdays with an extra stop at Little Bytham thrown in. If so light a train—four coaches—could get to Stoke Box (five and a quarter miles) in eight minutes, which it possibly could, even then the remaining eleven and a-half must be run in eleven minutes, including the slackening for Essendine.

† The West Coast Companies' "Edinboro' Race" train.

enough. But it really is a grand specimen of a good "all-round" English express, with its load of nearly one hundred and fifty tons for four-fifths of its run, with coaches from London for four or five different places; with no exceptionally long run to help it—in fact, with stops crowded thickly north of Doncaster, yet keeping splendid time into Leeds, York and Bradford, its three terminal points. To Peterborough it takes the same time as the "Dutchman" does to Swindon, one mile

TABLE IV.—LOG OF A FEW OF THE BEST TRAINS.

(a) 2 p.m. Down—Manchester Express. (Mod. load from K. C.; rather light beyond Peterboro.)

Dist. from K. C.	STATIONS.	Time from K. C.	Mn at Stn.	Journ'y Speed.	Running Average.	Flying Average.	Frm Stn. to Stn.			NOTES.
							Dist.	Time	Sp'd	
		H. M.						H. M.		
32	Hitchin (pass) ...	0 39	...	...	49 $\frac{1}{4}$	50 $\frac{1}{8}$	32	39	49 $\frac{1}{4}$	
76 $\frac{1}{4}$	{ Peterboro' (pass slowly) ...	1 25	slip	53 $\frac{3}{4}$	53 $\frac{3}{4}$	barely 55	44 $\frac{1}{4}$	40	57 $\frac{3}{4}$	
105 $\frac{1}{4}$	Grantham ...	1 59	5	53	53	54 $\frac{2}{3}$	29	34	*52 $\frac{1}{2}$	
120	Newark (pass) ...	2 20	...	...	53 $\frac{1}{3}$	55 $\frac{1}{8}$	14 $\frac{3}{4}$	16	*55 $\frac{1}{2}$	M. S. L. Eng. North of Grantham.
138 $\frac{3}{4}$	{ Retford (pass very slow) ...	2 40	slip	ovr. 52	53 $\frac{2}{3}$	55 $\frac{1}{2}$	18 $\frac{3}{4}$	20	56 $\frac{1}{4}$	
162	Sheffield ...	3 12	4	50 $\frac{1}{2}$	barely 52	53 $\frac{1}{2}$	23 $\frac{1}{4}$	32	*43 $\frac{1}{2}$	
184 $\frac{1}{4}$	Woodh'd (pass) ...	3 48	...	...	...	...	22 $\frac{1}{4}$	32	41	
203 $\frac{1}{4}$	Manchester ...	4 15	arr	47 $\frac{5}{8}$	49 $\frac{5}{8}$	over 51 $\frac{1}{2}$	19	27	*12 $\frac{1}{4}$	} A steep climb

(b) 6.15 p.m. up (2 p.m. Exp. from Manchester). Load: light throughout (from Sheffield to London).

Dist from Sheffield.	From Sheffield.									
28 $\frac{1}{4}$	{ Retford (pass very slow) ...	0 32	...	...	43 $\frac{2}{3}$	44 $\frac{1}{2}$	23 $\frac{1}{4}$	32	*43 $\frac{2}{3}$	
56 $\frac{3}{4}$	Grantham ...	1 10	5	48 $\frac{1}{3}$	48 $\frac{1}{3}$	50 $\frac{5}{8}$	*33 $\frac{1}{2}$	38	*52 $\frac{1}{2}$	
62	Stoke Box (pass) ...	1 23 $\frac{1}{2}$	...	...	...	...	5 $\frac{1}{4}$	8 $\frac{1}{2}$	over	
85 $\frac{3}{4}$	{ Peterboro' (pass slowly) ...	1 47	...	...	50 $\frac{3}{8}$	52 $\frac{1}{8}$	23 $\frac{1}{2}$	23 $\frac{1}{2}$	over 60	
130	Hitchin (pass) ...	2 35	..	...	52	over 53 $\frac{1}{2}$	44 $\frac{1}{4}$	48	55 $\frac{1}{3}$	
162	King's Cross ...	3 12	arr	50 $\frac{3}{8}$	barely 52	53 $\frac{1}{2}$	32	37	51 $\frac{1}{8}$	

(c) 1.30 p.m. Down. Leeds and Yorkshire Express. Load: heavy to Doncaster; mod. beyond.

Dist. from K.C.	From K.C.									
76 $\frac{1}{4}$	Peterboro' ...	1 27	4	52 $\frac{1}{2}$	52 $\frac{1}{2}$	54	77 $\frac{1}{4}$	*52 $\frac{1}{2}$	*52 $\frac{1}{2}$	
105 $\frac{1}{4}$	Grantham (pass) ...	2 7	pas s	...	49 $\frac{1}{4}$	over 53	29	*36	*48 $\frac{1}{2}$	
120	Newark ...	2 23	..	...	51 $\frac{1}{2}$	53 $\frac{3}{4}$	14 $\frac{1}{2}$	16	55 $\frac{1}{2}$	
138 $\frac{3}{4}$	Retford ...	2 43	..	...	52 $\frac{1}{2}$	53 $\frac{1}{2}$	18 $\frac{1}{2}$	20	56 $\frac{1}{2}$	
156	Doncaster ...	3 3	3	51 $\frac{1}{2}$	barely 52	53 $\frac{9}{16}$	17 $\frac{1}{4}$	20	*51 $\frac{1}{4}$	
175 $\frac{3}{4}$	Wakefield, Wstgt. ...	3 31	3	50	51 $\frac{1}{2}$	53 $\frac{1}{2}$	19 $\frac{1}{4}$	25	*39	
185 $\frac{1}{2}$	{ Holbeck ...	3 49	4	48 $\frac{1}{2}$	50 $\frac{3}{8}$	53 $\frac{1}{2}$	9	16	*37	
186	Leeds { Central ...	3 55	arr	47 $\frac{1}{2}$	50	53	0 $\frac{1}{2}$	...	...

(d) 10.40 a.m. Up. Mondays only. Peterborough to London. Load: rather light.

From Peterb.	From Peterb.									
17 $\frac{1}{2}$	Hunti'gdon (pass) ...	0 20	pas s	...	52 $\frac{1}{2}$	over 58	17 $\frac{1}{2}$	20	*2 $\frac{1}{2}$	
44 $\frac{1}{2}$	Hitchin (pass) ...	0 48	..	...	55 $\frac{3}{4}$	57 $\frac{3}{4}$	26 $\frac{3}{4}$	28	58	
58 $\frac{1}{2}$	Hatfield (pass) ...	1 3	..	...	barely 55	57 $\frac{1}{4}$	14 $\frac{1}{4}$	15	57	
73 $\frac{3}{4}$	Finsb. Park ...	1 20	2	55 $\frac{1}{2}$	55	57 $\frac{1}{2}$	15 $\frac{1}{4}$	17	*57	
76 $\frac{1}{4}$	King's Cross ...	1 28	arr	abt. 52	about 53	58	2 $\frac{1}{2}$	6	...	

* Approximate time of passing. Speed for 100 miles Stoke Box to London (100 miles in 108 $\frac{1}{2}$ mir.) 54 $\frac{1}{2}$; flying average, about 56.

† Includes starting from station at beginning.

* Includes slackening for Station at end.

further; that is, its pace is about three-quarter miles less than that of the Great Western train, but over far worse gradients. In the up-hill stretch that follows its weight tells, and it takes some thirty minutes over the twenty-four miles to Stoke Box. Thence, with the hill in its favour, its speed to Doncaster—just fifty-six miles in sixty-three minutes—averages fifty-three and a half an hour; while between Newark and Retford, it is timed to make fifty-five and a half, in spite of the $\frac{1}{10}$ climb near Tuxford.

Beyond Doncaster there is no opening for a fast run; but we may remark that if the train can reach Holbeck Station (Leeds) at 5.19—as it commonly does—it might as well be timed two minutes earlier than it now is into “Central.”

The new 9.45 Down, of course, deserves a place here, but was put on too late to be included.

TABLE V.—SOME HEAVILY WEIGHTED TRAINS.

The figures given below pretty well tell their own tale. Whether the 5.30 Down, or (in Summer when it has Scotch through coaches) the 10.50 p.m. Up has the harder task is a bit of railway casuistry on which we dare not pronounce. But the former train, being a “racing express” throughout, should perhaps rank first—we can certify from personal experience that it commonly keeps time. North of Grantham it has a M. S. L. engine, and though somewhat lighter from that point, it is thence to Guide Bridge inclusive that it is screwed up tightest in its timing.

TRAIN.	Load in 6-wh. Coaches.	Load with extras.	Journey Dist.	London to — in h. m.	No. of Stops	Time allowed at Stas.	Longest Run.	Time on Run.	Journ'y Speed.	Runn'g Aver.	Flying Aver.
10.25 a.m. Down Scotch and Scarb. Express	from 13 to 15 through-out.	A	188 $\frac{1}{4}$	York 3 57	2	6	105 $\frac{1}{4}$	h. m. 2 8 (speed 49 $\frac{1}{3}$)	47 $\frac{3}{8}$	over 48	50 exactly.
		...			includ. Tekt. Pl						
5.30 p.m. Down X	Equal to 12 fr. K.C. 9 at Gthm. 8 after Retford.	...	203 $\frac{1}{4}$	Manchester 4 30	5	16	105 $\frac{1}{4}$	2 3 (speed 51 $\frac{1}{3}$)	45 $\frac{1}{4}$	barely 48	50 $\frac{3}{4}$
10.50 p.m. Up.	Not less than 10 throught.	Up to 18, York to Doncaster up to 14 thence to London.	188 $\frac{1}{4}$	York to London 4 20	9	B 20 nominl.	44 $\frac{1}{4}$ (mostly up-hill)	53 (speed 50 $\frac{1}{10}$)	43 $\frac{1}{2}$ (barely)	over. 47	52 $\frac{1}{4}$

A. That is with horse-boxes and carriage trucks added, when these are conveyed.

B. The time given at three or four of the “stops” is so short that the *real* time at stations must be 25 minutes or so.

X. Flying average—Retford to Sheffield, 50 $\frac{1}{2}$; Sheffield to Manchester, 43 $\frac{1}{4}$; or 5 $\frac{1}{2}$ and 0 $\frac{1}{2}$ respectively better than the 2 p.m. express.

THE EDINBURGH “RACING” EXPRESS OR “FLYING SCOT.”

So much has already been said in newspapers, magazines, and pamphlets on “The Race to Edinboro’,” that a lengthy notice of it is not needed, and would have the look of being “cribbed” from the

writings of others. But the "Special Express" itself is too fine a sample of what Great Northern engines *can* do, and yet have something in hand, for it to be altogether passed over. Also, it is quite "on the cards"—though we do not set up as a foreteller—that next summer may see the race begin again. Since it befell that neither in "Bradshaw" nor the official penny books, nor even in the "Working Time Tables" for the company's servants, did the 10 a.m. "Special Edinboro' Express" appear at all, and also because its *last* alteration, from August 20th, is not chronicled even in Mr. Foxwell's *A Great Railway Year*,* we have thought it worth while to give its times in full for the whole month.†

The table of speeds is given for its timing for the third week in August, because that was the latest for which an official circular was issued, the last set of times being only printed in the guard's weekly notice-pamphlet of excursions, specials, &c.

The trip of August 31st is given both because it was part of the "record" run to Edinboro' (7h. 27m.), and also because we ourselves fared in it, and took the times with great care throughout.

It should be noted that the times, grand as they are, do not give a higher speed than the ordinary 10.40 up has been making between Peterborough and London every Monday for years past, without any one heeding it at all; while up to August 21st the time to Grantham was no faster than that of the 6.15 p.m. up; in other words, the King's Cross authorities were already giving the public the benefit of almost the highest speed an engine and train could be called on to give, in their ordinary trains throughout the year. The rival train, or "Flying Nor'-Western," was nowhere timed to make a "platform to platform" run at more than the best pace of existing Great Northern daily trains—not within a mile an hour of the 10.40 up's best run—while from Euston

TABLE VI.—TIME BILL AND LOG OF EDINBURGH SPECIAL EXPRESS.

Miles from K. C.		Miles sta. to sta.	Aug. 1 to 4 incl. A	Aug. 6 to 11 incl. B	Aug. 13 to 18 incl. C	Speed point to point	From London.			Ag. 20 to end of month. D
							Jour.ney Spe'd	Run-ning av.	Fly-ing av.	
	King's Cross dep.	...	a.m. 10 0	a.m. 10 0	a.m. 10 0	C	C	C	C	10 0
17 $\frac{3}{4}$	Hatfield pass	17	10 22	10 22	10 22	48 $\frac{3}{4}$	...	48 $\frac{3}{4}$	52	10 21
32	Hitchin "	14 $\frac{1}{2}$	10 37	10 37	10 37	57	...	51 $\frac{1}{2}$	54 $\frac{1}{2}$	10 36
58 $\frac{3}{4}$	Huntingdon "	26	11 6	11 5	11 5	58	...	54 $\frac{1}{2}$	55 $\frac{3}{4}$	11 4
76 $\frac{1}{2}$	Peterboro' ... pass slowly	17	11 25	11 23	11 23	58 $\frac{1}{2}$	...	55 $\frac{3}{4}$	56 $\frac{3}{4}$	11 22
	arr.	29	11 59	11 57	11 57	*51 $\frac{1}{2}$	...	...	...	11 55
105 $\frac{1}{4}$	Grantham {		p.m. 12 4	p.m. 12 2	p.m. 12 2	...	54	54	55 $\frac{1}{2}$	12 0
	dep.	...	12 4	12 2	12 2	†57	...	54 $\frac{1}{2}$	56 $\frac{1}{2}$	12 16
120	Newark pass	14 $\frac{1}{2}$	12 20	12 18	12 17	57 $\frac{1}{2}$	...	55 $\frac{1}{2}$	56 $\frac{3}{4}$	12 35
138 $\frac{3}{4}$	Retford "	18	12 46	12 37	12 36	59 $\frac{1}{2}$	...	55 $\frac{1}{2}$	56 $\frac{3}{4}$	12 54
156	Doncaster "	17	12 59	12 56	12 54	58 $\frac{1}{2}$	...	55 $\frac{1}{2}$	56 $\frac{3}{4}$	1 14
174 $\frac{1}{2}$	Selby "	18	1 19	1 16	1 14	54	...	55 $\frac{1}{2}$	56 $\frac{3}{4}$	1 14
188 $\frac{1}{4}$	York arr.	13	1 35	1 32	1 30	*52	53 $\frac{3}{4}$	55	56 $\frac{3}{4}$	1 30
								over		

As timed in column C: Grantham to York, 83 m.; speed, 56 $\frac{3}{4}$; flying av., 58 $\frac{1}{2}$.

" " D: K. C. to Grantham, speed, 55 (barely); " " 56 $\frac{1}{4}$.

* In "Best Trains" (*P.M.G.* "Extra"), p. 42.

† This last re-timing is important, from giving the fastest official time between London and Grantham (1.55) that a train had as yet been booked to do.

* Includes slackening.

† Includes starting.

to Crewe its "flying average" fifty-three and two-fifths full, is *lower* than that of the 1.30 p.m. to Doncaster—a train of more than twice its weight. (In saying this we would not seem to disparage the wonderful speeds on a steep up-grade made by both London and North Western and Caledonian Companies with this train—in that respect it stands unmatched). Of course all four Companies concerned in the "race" did run much under the official times, and so much above the official speeds, but this was largely due to the drivers knowing they had "a free hand" as to coal, &c., in a way they would not in the case of regular trains.

	Miles sta. to sta.	Fast- est run made	As Run on Aug. 31st.				Notes on Aug. 31st run.
			Time.	Spe'd point to point	Run- ning av.	Flying av.	
King's Cross dep. ...		a.m.	a.m.				|| Guard's journal gives 10.21 Hatfield, 12.8 Newark, but is probably wrong.
Hatfield .....pass	17 $\frac{3}{4}$	10 10	10 0	...	...	...
Hitchin "	14 $\frac{1}{4}$	10 35	10 35 $\frac{1}{2}$	|| 48 $\frac{3}{4}$	48 $\frac{3}{4}$	52	
Huntingdon .. "	26 $\frac{3}{4}$	...	11 0	64 $\frac{3}{4}$	54 $\frac{1}{2}$	57 $\frac{1}{2}$
Peterboro' ... "	17 $\frac{1}{2}$	11 15	11 17 $\frac{1}{2}$	60 $\frac{3}{4}$	58 $\frac{3}{4}$	60 $\frac{3}{4}$	barely † Checked a little outside Don- caster, and slowed for 1 min. at Shaftholme June.
Grantham { dep. ...	...	11 50	11 50	...	...	...
		11 54 $\frac{1}{4}$	11 54 $\frac{1}{4}$	...	...	...
		p.m.	p.m.	...	...	...
Newark .....pass	14 $\frac{3}{4}$...	12 10	|| 56	57 $\frac{1}{2}$	59	† Train took quite 2 mins. to pass through Selby sta., but did not actually stand still.
Retford "	18 $\frac{3}{4}$	...	12 28 $\frac{3}{4}$	60	57 $\frac{1}{2}$	59 $\frac{1}{10}$
Doncaster ... "	17 $\frac{1}{2}$	...	12 45 $\frac{3}{4}$	61 $\frac{3}{4}$	58	60
Selby "	18 $\frac{1}{4}$	...	{ ar. 15 $\frac{1}{4}$ dp. 1 7 }	57 $\frac{3}{4}$	58s	60s
York... ..arr.	13 $\frac{3}{4}$...	1 22 $\frac{1}{2}$	* 53 $\frac{1}{4}$	57 $\frac{3}{4}$ s	60s	

The writer compared his watch both with the guard's and with station clocks at King's Cross, Grantham and York, and is sure that the above times are right within a few secs. The train speed is a little over-estimated in "Best Trains," p. 9, as its times of departure from Grantham and York are there given $\frac{1}{2}$ and $\frac{3}{4}$ mins. later respectively than the true time. (York depart 1.48 $\frac{1}{4}$.)

* Selby delay not allowed for in "running av.," but reckoned in "flying av."

A FAST GOODS TRAIN—AND A CONTRAST.

From the "Flying Scot" to a goods seems somewhat of a drop. But the Great Northern itch for high speed breaks out even in goods trains, and one "champion" instance is worth citing. Of course such trains as "meat," "fish," or "fruit" expresses, which, though belonging to the merchandise class, have spring-buffered stock and are often drawn by

TABLE VII.—A FAST GOODS TRAIN (3.20 p.m. down, to York for Scotland). Load 23.

	Miles from K. C. Goods.	Time.		Mins. at stas.	Speed from point to point.	Speed from London (includ. stops).	Run- ning av.	Notes.
		H.	M.					
Hitchin	30 $\frac{3}{4}$	1	0*	5	31 $\frac{3}{4}$...	31 $\frac{3}{4}$	* Calls at Huntingdon Mondays only at 1.50
Peterboro' ...	76	2	20	5	nearly 36	32 $\frac{1}{2}$	33 $\frac{7}{8}$	
Grantham ...	105	pass	3 15	pass	34 $\frac{1}{2}$...	33 $\frac{3}{4}$	All these times are quite up to the level of many continental passenger "expresses."
Newark ...	114 $\frac{3}{4}$	3	40	10	35 $\frac{1}{4}$	32 $\frac{3}{4}$	over 34	
Retford	138 $\frac{1}{2}$	{ 4 22 (pass)	stops if required	}	35 $\frac{3}{4}$	...	34 $\frac{1}{2}$
Doncaster ...	156 $\frac{3}{4}$	4	50	10	37 $\frac{1}{2}$	32 $\frac{3}{8}$	34 $\frac{5}{8}$	
York	188	5	55	arr.	nearly 35	31 $\frac{3}{8}$	34 $\frac{1}{8}$	
York	Run.	time	5 25	...	...	...	...

passenger engines, make full passenger speeds, but this train is a *bonâ fide goods*, with a "3-coupled" engine. Its load of course is light—twenty-three waggons—but still is far heavier than that of a passenger train. Yet its inclusive speeds compare well with those of the Southern Companies' passenger trains which are specially marked as "express" or "fast" in the time-tables.

G.N. Goods ... 58½m. (to Huntingdon) in 1h. 50m. speed 32m.

S.E. Passenger 61½m. (to Hastings) * in 2h. 0m. „ 30¾m.

(11.15 a.m. "Fast Train" from Charing Cross).

or again—

G.N. Goods ... 76m. (to Peterborough) in 2h. 20m. speed 32½m.

L.C. & D. Passenger 77m. (to Broadstairs) in 2h. 24m. „ 32½m.

(“Kent Coast Express,” 5.15 from Victoria).

FASTEST RUNS ON OTHER COMPANIES' LINES.

Only a few words can be said on this head, or this chapter would soon swell out to twice the size of the rest of the pamphlet. For an actual quickest run, platform to platform, the *Great Western* takes first place after the *Great Northern*. By no less than *four* trains (11.45 and 3.0 down, 2.45 and 8.10 up), it makes a run of seventy-seven and a-quarter miles—London and Swindon—in eighty-seven minutes, a speed of fully fifty-three and a-quarter miles, and this with trains by no means light; their wonted load being about equal to ten coaches (narrow gauge).† But the down trains can barely make their time into Swindon, and the ups have the most perfect gradient throughout—a very slight downhill all the way, so that the performance is hardly so good as it looks on paper.

Again, between Bristol and Taunton, the same trains cover forty-four and three-quarter miles in fifty-one minutes, a speed (on a very level line) of over fifty-two and three-fifths miles; but here, alas, is told all there is to tell of *Great Western* high speeds throughout all the great 2,500 odd miles of their system.

Having slowly awakened from the "sleep of ages," the *North Western* now takes a very high place with two of its Scotch trains (the 10 from and 6.30 p.m. into Euston), besides making several other good runs of fifty-one to fifty-two miles an hour, the full ninety miles between Carlisle and Preston is done in one hundred and two minutes, *i.e.*, at just fifty-three miles an hour, and this with a fearful climb in the earlier part of the run! But the train at this point is a *very* light one, so much so as to hardly come into comparison with the broad-gauge *Great Western* or the heavier *Great Northern* trains. The same train (up) also runs from Rugby to Willesden, seventy-seven and a-quarter miles, this time with a fair average load, in eighty-nine minutes, or just over fifty-two miles an hour. (This train's "running average" throughout from Carlisle to London is the remarkably good one of all but fifty-one an hour).

Though really doing great things over most awkward gradients, the *Midland*, until very lately, had only the 2.0 p.m. down to Nottingham,

* St. Leonards (Warrior Sq.) station; or Cannon Street to Hastings terminus.

† Its average is four broad-gauge bogies and two break vans, one of which, at least, is eight wheeled; total weight about 120 tons, or rather more than nine *Great Northern* coaches. It sometimes runs with seven or eight vehicles, but then always loses time. (This applies to both "Dutchman" and "Zulu," down and up).

which could be held up as an instance of very high speed, station to station. (We have already spoken fully of this train on p. 12). But the quickest Scotch expresses, especially the Glasgow ones, give several fine runs. The best of these is made by the up train (7.45 into St. Pancras), which covers the ninety-nine and a quarter miles from Leicester in one hour and fifty-four minutes, a speed of fifty-two and one-third miles, with many stiff bits of up-hill, and a moderately heavy load. The down train takes only one minute longer, on a still worse gradient.

The *North Eastern*, as we have already mentioned, achieves fifty-two miles an hour between Darlington and York, with a train sometimes very heavy, but on a most favourable bit of line for fast running; this is done in a service in which they are partners with the Great Northern; in no other case do their easy gradients tempt the North Eastern to any speed much, if anything, over fifty miles an hour.

The tale of the *Caledonian's* best train is already told, on page 13 and the note thereto; its fifty-one and a-quarter miles an hour is a noble performance when gradients are considered. The *Lancashire and Yorkshire* seems inclined to do some running over its new Atherton line to Southport, etc. The remaining lines may, as mathematicians say, "be neglected."

TABLE VIII.—BEST "PLATFORM TO PLATFORM SPEEDS" of G. N. and other Co.'s.

G. N.	"Foreign" Co.s	G. N.	"Foreign" Co.s
55½ (by two trains)	...	52½	52½ Mid.
54½	...	&c.	52 N. E. (one train)
54	...	...	51½ Caled. (one train)
53½	53½ G. W.	...	49½ S. W. (New Bournemouth)
53⅓	(barely) 53 L. & N. W.	...	48½ G. E. [Fast]
	(Scotch Exp.)	...	47 L. C. & D., &c.
52⅔ (many trains)	52½ Mid. (one train)	...	

"Race to Edinburgh," speeds, 56½ and barely 55, G. N. (as officially booked to run).
 "Foreign."—Caled., 54 (over steep gradients). L. & N. W., 54 (with steep climb, but much down hill also). N. E., Running av., York to Edinb. about 53½ (the intermediate N. E. times are quite uncertain).

COMPETITION WITH OTHER LINES.

[This section was put into shape before the new Leeds express in three hours fifty minutes was heard of.]

It happens, oddly enough, that though the best Great Northern trains were never faster, nor their *average* speed higher, than at the present time, yet in competing against "Foreign" companies there has been something of a falling off at two or three important points. The loss of the three and three-quarter hours expresses to *Leeds*, of 1880 (see Table X.), has never been made good—in the face of the Midland quickening of twenty-eight minutes, though, we may fairly hope to see a spurt at King's Cross before next summer. The *Nottingham* traffic seems to be thought not worth fighting for,* as by altering the connections at Grantham the Great Northern could now save eight minutes or so to

* The speed by the best *Down* trains has not been lowered, but no attempt has been made to meet the important quickening of the Midland.

that place without quickening pace, and from *Cambridge* the inclusive speed of the best train has been lowered by two minutes since 1883, by putting in an extra stop. On the other hand, the energy of the Manchester, Sheffield, and Lincolnshire has given back Gainsboro' to the "Retford allies," after the Great Eastern had seemingly made it their own.* * It seems a pity that *all* the Cambridge fast trains should be burdened with at least two (often with three) intermediate stops; whence it befalls, that though the *average* of the Cambridge service is magnificent, yet no "record" is achieved by any one of these light trains; also that the best Great Eastern train, running down without a "stop," wins the race by two minutes. On the whole, however, the following table shows how constantly the Great Northern "sets the pace" to nearly all competing points.

TABLE IX.—TIMES BETWEEN LONDON AND COMPETING POINTS.

PLACE. (M. by <i>Main Line</i> : Br. on <i>Branch</i> .)	BY G.N.R.			BY FOREIGN LINES.				Quickest Route	by mins.
	Miles	Time	Speed m. pr h.	Co.	Miles	Time	Speed m. pr h.		
Cambridge.....	58 (Br)	1 17	45 $\frac{1}{3}$	G.E.	55 (M.)	1 15	44	G.E.	2 (up 1)
Nottingham	127 $\frac{3}{4}$ (Br)	{ 2 40 48 dn. 2 47 45 $\frac{1}{2}$ up		Mid.	124 (M.)	2 25 51 $\frac{1}{2}$ dn 2 24 51 $\frac{1}{2}$ up		Mid.	15 dn 21 up.
Lincoln	130 (Br)	2 47 46 $\frac{1}{2}$ dn 3 0 42 $\frac{1}{2}$ up		G.E.	145 (M.)	3 28 41 $\frac{1}{2}$		G.N.	41 du. 28 up.
Gainsboro', via Retford (M.S.L. sta.)	149	{ 3 6 48 $\frac{1}{4}$ dn 3 15 45 $\frac{1}{2}$ up		G.E.	160 (M.)	3 50 42 barely		G.N.	45 (up 35)
Sheffield	162	3 12 50 $\frac{2}{5}$		Mid.	158 or 164	3 30 47 †		G.N.	18.
Do. by 2nd quickest tr.	...	3 20 48 $\frac{3}{5}$		...	...	...		„	by 2nd tr. 10
Barnsley { via Penist. Direct	182 $\frac{1}{2}$ 180 (Br)	4 13 43 $\frac{1}{2}$ dn 4 5 44 up		} Mid	*187 {	4 20 43 dn 4 35 40 $\frac{3}{4}$ up		G.N.	7 dn. 30 up.
Manchester	203 $\frac{1}{4}$	4 15 47				N.W.	188 $\frac{1}{2}$			4 15 44$\frac{1}{2}$		Same time by all three lines.
†Leeds { Holbeck stn. Terminus ...	185 $\frac{1}{2}$ 186	3 49 48 $\frac{1}{2}$ 3 55 47 $\frac{1}{2}$ ¶	{	} Mid {	196 or	4 7 49 $\frac{1}{4}$		G.N.	18 to Holb. 12 to Centr.
	†Bradford	192 (Br)			4 7 46 $\frac{1}{2}$ (up)	202 209 $\frac{1}{2}$	† †			46$\frac{1}{10}$
	172 (Br)	4 10 3 55		Mid.	215 $\frac{1}{2}$ *188 $\frac{3}{4}$	4 40 4 40	...	G.N.	45

* Dist. is via Nottingham and Sheffield.

† The quickest Midland trains to Sheffield, Leeds and Bradford run by the *longer* route, via Melton and *Nottingham*.

¶ The Midland quick train stops only *once*; G.N. stops three (with Holbeck, four) times. *All other Midland* express trains take 4h. 25m. (dist. 20 $\frac{1}{2}$ miles), as against several in 4h. 0m. (Holbeck 3h. 57m.) by G.N.

‡ On the *summer* tables. The time for Leeds and Bradford is now quicker; to Pontefract rather slower.

* * The excellent new express, Retford to Cleethorpes, and *vice-versa*, put on by the Manchester, Sheffield, and Lincolnshire this spring, has escaped Mr. Foxwell's notice in "Seaside Expresses" ["Best Trains," pp. 16-18], but deserves to be chronicled. But why make London passengers for it change *both* at Grantham (into "slip") and again at Retford?

GREAT NORTHERN FAST RUNS IN FORMER DAYS.

Great Northern trains were never doing more, as to either the fastest runs, or the average of high speeds, than they do now, but the two following cases of splendid running, both in the summer of 1880, are worth recording. The Leeds expresses, because their "running" and "flying" averages, taken from *terminus* to *terminus*, were higher than any now attained, and because their time between London and Leeds was ten minutes* better than that of the fastest train now running—the "Lord Mayor's Special," because its Grantham to York run foreshadowed the Edinboro' "racing" performances.

TABLE X.—FORMER FAST RUNS (1880).

(A.) *Leeds Expresses (two each way).*

Dist. from K.C.	Stations.	Time. H. M.	Jour-ney speed.	Run-ning average	Flying average	Notes.
	King's Cross.....	...	...	...	...
105 $\frac{1}{4}$	dep. 3.45 & 6.30 p.m.					
	Grantham	2 3	51 $\frac{1}{3}$	51 $\frac{3}{8}$	52 $\frac{1}{3}$	Speed : Grantham to West- gate (Wakefield) [70 $\frac{1}{2}$ m. in 77min.] all but 55m. an hour (flying av. 57).
175 $\frac{3}{4}$	Wakefield... .. .	(stops 4m.) 3 24	51 $\frac{1}{4}$	52 $\frac{1}{2}$	54 $\frac{1}{4}$	
185 $\frac{1}{2}$	Leeds { Holbeck...	(stops 2m.) 3 41	50 $\frac{1}{3}$	51 $\frac{3}{4}$	53 $\frac{1}{2}$	BB Bradford part 4 mins. at Wakefield. (A) via Ardsley. 3 stops be- tween Wakefield and Bradford. (B) by longer route via Batley, with 4 stops !
186		{ Central 3 45	49 $\frac{1}{4}$	51 $\frac{1}{3}$	53 $\frac{1}{2}$	
193 $\frac{1}{2}$	} BB Bradford.....	4 0 {	48 $\frac{3}{4}$ (B)	51 $\frac{1}{2}$	54 $\frac{1}{4}$	
192			48(A)	50 $\frac{1}{2}$	53 $\frac{5}{8}$	

The timing of the Bradford portion of the 3.45 dn. in the short runs north of Westgate was of the most "impossible" kind.

(B.) "*Lord Mayor's*" *Special Trip*, Aug. 31, 1880.

	p m.	SPEED FROM LONDON		Speed from Station to Station.	Grantham to York.	Note.
		Run-ning average	Flying Avege.			
King's Cross dep.	1 59	
Grantham { arr.	3 59 $\frac{1}{2}$	
dep.	4 10	52 $\frac{1}{2}$	53 $\frac{2}{3}$	52 $\frac{1}{2}$	} 57 $\frac{1}{2}$ flying average 59 $\frac{2}{3}$	† Flying average, Grantham to Newark, about 70m. an hour.
Newark pass	4 25	...	barely 54 $\frac{1}{4}$	59 $\frac{1}{3}$ †		
Retford "	4 43	...	over 55 $\frac{1}{3}$	61 $\frac{2}{3}$		
Doncaster ... "	5 2	...	55 $\frac{1}{2}$	57		
Selby "	5 21 $\frac{1}{2}$	...	just 56	58	
York arr.	5 36 $\frac{1}{2}$	54 $\frac{3}{4}$	56 $\frac{1}{4}$	56		

Though this was a specially light train, yet the heavier "Flying Scotchman" was able exactly eight years later to "break" its "record" at almost every point.

* Five minutes only, since November 1st, as to Down trains.

APPENDIX.

Ought the Race to Edinburgh to begin again next Summer ?

It takes two to make a race, just as it does to make a quarrel, though in a race "time" may be one of the runners. In this case it takes *four*, for if any one of the companies by either route be not willing to start no race is possible. For this reason, at least, if not for others, we cannot say, or even guess, whether a race there will be; that a race there *ought* to be, so far as the East Coast partners are concerned, we have no doubt whatever.

"But it is a waste of the shareholders' money: it is dangerous: it is encouraging reckless competition elsewhere!" By no means.

(1.) The race of August last was no waste of money for the Great Northern or the North Eastern, except the cost of a few hundred tons of coal and some gallons of lubricating oil consumed in running at a somewhat higher speed than usual. The "Flying Scotchman" had grown so much heavier from its carrying third-class passengers * that it *must have been run in two bits* almost every day. The 10.0 a.m. train had never less than seven, more often *eight*, sometimes *nine* or *ten* coaches on; the 10.5 (ord. "Flying Scotchman") ranged from seven (quite at the end of the month) to *nine* or *ten* in the busy time. Thus the aggregate load would have never been under *fourteen*, sometimes *eighteen* coaches or more—for both parts were mostly well filled. Now, much as Great Northern engines can do, you cannot hope that an "eight-foot single" will drag a train of that length at an average speed of over fifty miles an hour, with many up-hill stretches on the way.† So that it was plainly needful to run a "special" part; all that was done besides was to heighten the speed of that first part to the level already touched by an up train of the same weight, and to take out a needless "stop" at Berwick. Next year, the "third-classness" of the 10 a.m. from King's Cross being more widely known, the lengthening of the train may begin earlier than August 1st; if it must be divided (whenever that time comes), why should it not be quickened? "Because it is fast enough already," the objector may answer. Softly, good critic; we will argue that point later on. The West Coast allies, even in the winter, are running an extra train from Preston to Edinboro',‡ and from Edinboro' back to Crewe—433 train miles a day—for the sake of shortening the journey (to one town only) by half-an-hour; this *might* be called a waste of money, though we do not say that it is: the East Coast Companies have raced, and may race again, without running any extra mileage at all.

(2.) To prove that such running is not dangerous, would only be to pour water on a rat Mr. Foxwell and Mr. Acworth have thoroughly

* There was no "aggression" in these third class bookings by the 10 a.m. For the 8 p.m. from King's Cross had hitherto been a quarter-of-an hour *quicker* to Edinboro' (same time in winter as the 10 a.m.), and ten minutes quicker to Glasgow; it had always been a third class train.

† When thus divided, the *punctuality* of each part was phenomenal. The "ordinary" train, starting at 10.5, and timed to run to Edinboro' in 8h. 25m., was "on time" into York and into Waverly terminus *every day* in August, except when it was from one to five minutes *early* at either place.

‡ From December 1st it is the *Perth* part which is separated, but the mileage is the same.

drowned. See also our remarks, under the heading, "speed is safety," on p. 6 of this pamphlet.

(3.) *Reckless* competition is indeed an evil: *competition—as such*—may bring gain and not loss to both competitors, for in many cases a good service *makes* traffic to no small degree. Bad as was the weather this summer, the Scotch traffic was remarkably good. Some of the increase here was due, we are almost certain, to the bettering of the service by all these routes: even the outstripped Midland took its share, we fancy. However this may be, it is with the East Coast Companies a simple question of holding their own. They have the shorter way to Edinburgh by full $7\frac{1}{4}$ miles; their gradients as a whole are so much easier that they have fully 20 minutes the best of the run, even for very light trains; * when it came to racing, they won on the official times by 15 minutes, even on the actual best run by 11 minutes, and on the average of the last half of the month (when the N. E. woke up to the fact that they were "in" for a race), by quite 20 minutes. Also, as an able writer in the *St. James's Gazette* pointed out, ever since the Great Northern line was first opened, the East Coast route had been in front of all competitors.

But how do things now stand? Even while "the race" was on, they had half-an-hour the best of the *up* journey, but now, up as well as down, for the first time the Euston and King's Cross routes stand level—8 hours and 30 minutes by either.

Yet, if this were all, it might be borne; for Edinburgh alone is not very important, except perhaps for a few weeks each year. For the West Coast lines it is a branch terminus—a "dead end," and if they *will* run "neck and neck" for it, well. . . . But it is *not* all; far from it. To both the East Coast and Midland it is the key of nearly all Scotland; from King's Cross it is the only key. "Let us agree," says Mr. Moon, "to run in the same time to most places: we crawl to Manchester, you must saunter to Edinburgh." Very good, Mr. Moon, but for you Manchester and Edinburgh lead no whither. How about *Larbert*? "Oh!" answers Mr. Moon, "We leave Larbert out of the treaty, and while you must suit your pace to ours up to Edinburgh our Caledonian friends will run their hardest through Larbert to Perth, Dundee, and all Scotland beyond the Lothians!" Quite so, and so long as the East Coast Companies are tied down to taking $8\frac{1}{2}$ hours between King's Cross and "Waverley," everything North of the Forth is safe in West Coast hands. Just now, the 10.30 a.m. from Euston is taken off for the winter, but it is sure to bloom again in the spring; by means of this excellent train, the following revolution was worked in the relative position of the competing lines between London and Stirling—inuch the same times hold good of Larbert, Perth, &c., &c.:—

		EAST COAST.		WEST COAST.	QUICKEST BY
		H.	M.	H. M.	
Summer Season, 1887 ...	[Day	10	25	10 26	Same time.]
	Night	10	2	10 16	E. C. 14 min.
" " 1888 ...	[Day	9	53	9 26	W. C. 27 "
	[Night	10	2	9 49	W. C. 13 "]

* The London and North Western and Caledonian are in this dilemma. While their train remains light enough to climb Shap and Beattock banks at the splendid pace it did last August, they cannot be winning much new traffic: so soon as they *do* gain passengers, and their train becomes as heavy as the East Coast one, their steep grades will tell much against them, and they will be "handicapped out of the race."

(In 1887, the night trains, 8.0 p.m., were the quickest; this year, the 10.0 and 10.30 morning ones are the best.)

These figures may startle some of our readers; we know they somewhat startled us when we first worked them out. To Glasgow, too, the W. C. were only 25min. ahead, now they lead by 50min.* The writer does not own a single share in any "East Coast" line, but if he did, and this state of things were to last through next summer, he would cry out pretty loudly as to the shareholders' loss from *not* racing.

"But when the Forth Bridge is open?" Why then the Caledonian beyond a doubt will make their fine new engines do their best, and very good their best is, to hold Perth and Dundee. We cannot hope that the sluggish North British will keep pace with them; so that if the English Companies are to get their moneysworth for their share of the bridge, they must be free to run to Edinburgh in as good time as they can.

Lastly, our supposed objector will cry out, "What about retaliation: Manchester, and so forth?" Well, much as lovers of speed would enjoy a "race to Manchester," where the Great Northern having all the worst of the handicap, would for once be fairly extended, it is true that with some 15 miles less to go (or by the North Stafford Railway over 20 miles) and all the best of the gradients, the North Western must in the end win *that* race. Yet, as we have shown, the "Retford allies" have something in hand even now, and with a new curve at Retford and a bank engine for Woodhead, might not be much behind into London Road, by *the best train*. Meanwhile, fast service to Manchester would make competition easy to Warrington, Southport, and Liverpool itself; not that the Great Northern could ever be the best line for these places, but it might carry a good many passengers where it now takes none. Then the Midland would most likely be stirred up to emulation, and if outpaced to Manchester and Liverpool might strike at Birmingham. And so on, and so on: perhaps to everyone's loss in the end, but certainly not much to the North Western's profit. All this would be well seen of the Euston authorities before hostilities began, so that the "reckless competition" danger need hardly be reckoned with.

Be this as it may, even the peace-loving chairman of the North Eastern stands pledged by a public speech to "exhaust," if need be, "the resources of civilisation" in order to hold for the East Coast lines the larger share of traffic which their natural advantages has hitherto given them. But as things now stand, they have lost the lead at *every* point, down and up; the loser has taken the stakes, the strongest has gone to the wall. Therefore, &c.,—but the conclusion is obvious.

* The 8.0 p.m. from King's Cross ran down in 10 hrs. 10 mins.; the 10.0 a.m. from Euston in 9 hrs. 45 mins. Now the latter train takes only 9 hrs.; while the 10.0 a.m. from King's Cross takes 9 hrs. 50 mins.

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